

Uterine Cancer Morbidity Data

—Memphis and Shelby County, Tenn., 1950–51—

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A COOPERATIVE PROJECT for screening the female population 20 years of age and over for uterine cancer by means of vaginal exfoliative cytology is being conducted in Memphis and Shelby County, Tenn. The project is based on an epidemiological and statistical method proposed by Dunn (1) for resolving the question as to whether carcinoma in situ of the cervix is usually a stage of invasive cervical cancer. The study is now in progress, and some of the preliminary findings have been reported (2, 3).

One of the essential requirements for the method being used in the study is information on age-specific incidence rates for cervical carcinoma. The 1950 and 1951 cancer morbidity data for Memphis and Shelby County are pre-

sented in this report. The technique used for acquiring these data was the same previously used to obtain cancer morbidity data in a number of metropolitan areas in the United States and has been adequately described by Cutler (4).

Cooperating in this project are the Memphis and Shelby County Medical Society, the Bluff City Medical Society, the departments of pathology and of obstetrics and gynecology of the University of Tennessee Medical School, the Memphis and Shelby County Health Department, the local division of the American Cancer Society, and the Field Investigations and Demonstrations Branch of the National Cancer Institute.

The Data

At the time of the 1950 census there were 164,325 women 20 years of age and older in Memphis and Shelby County. There were 91,294 white and 49,419 nonwhite women in the city of Memphis and 17,881 white and 5,731 nonwhite women in the county outside the city. The nonwhite population is almost entirely Negro.

In order to obtain as reliable estimates of uterine cancer morbidity rates as feasible for the study area, data were collected on cases seen in 1950 and 1951. During these 2 years 970 cases of uterine cancer were seen by physicians and at medical facilities of the area. Of these, 498 were residents and 472 were nonresidents.

A higher proportion of the nonresidents were white (74 percent). The residents were more

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Table 1. Number of cases of cancer of the uterus seen in Shelby County during 1950 and 1951, by residence status, race, and site

Primary site	Total			Residents			Nonresidents		
	Total	White	Non-white	Total	White	Non-white	Total	White	Non-white
Total.....	970	611	359	498	260	238	472	351	121
Invasive neoplasms.....	883	566	317	441	237	204	442	329	113
Cervix.....	687	411	276	354	182	172	333	229	104
Corpus.....	127	112	15	45	34	11	82	78	4
Other and unspecified.....	69	43	26	42	21	21	27	22	5
Carcinoma in situ of the cervix.....	87	45	42	57	23	34	30	22	8

evenly divided, 52 percent white and 48 percent nonwhite (table 1). Although 66 percent of the female population 20 years of age and over in Memphis and Shelby County is white, this racial group accounted for little more than half the uterine cancer among residents.

The 498 residents with uterine cancer seen in 1950 and 1951 are fairly evenly divided between those first diagnosed in 1951, in 1950, and prior to 1950 (table 2). The number of invasive uterine malignancies first seen in 1951 was a little less than the number for 1950, but this difference is within the limits of sampling variation. Because the morbidity field study was done in mid-1952, under-reporting for 1951 as compared to 1950 was precluded as a factor responsible for this difference.

The carcinomas in situ of the cervix reported are in part the result of exfoliative vaginal cytology examinations conducted in a few of the medical facilities in the area during this time. These data cannot be used to compute rates because the base population examined, from which these cases were identified, is unknown.

Of the 347 residents with uterine cancer initially diagnosed in 1950 or 1951, 34 were not reported by physicians or hospitals but were found in a search of the death records for this period. Many of these patients presumably were only attended medically at or near the time of death and therefore were not reported from the usual sources. Of the 313 living resident cases diagnosed in 1950 and 1951, 290 (92.7 percent) were reported by hospitals, and 23 by physicians only (table 3).

Of the total group of invasive neoplasms reported by physicians and hospitals, 92 percent were microscopically confirmed. The few cases reported by physicians only, presumably women refusing treatment or cases in which the disease was beyond the benefit of therapy, were confirmed microscopically in 61 percent of the cases. The high percentage of cases microscopically confirmed holds true for both racial groups, except for the small group of nonwhite cases seen by physicians only, which were microscopically confirmed in but half the cases. Carcinoma in situ, of course, is a histopathologic diagnosis.

The 347 resident cases of uterine cancer first diagnosed in the years 1950 and 1951, including those discovered from death certificates and not otherwise reported, occurred almost equally in

Table 2. Number of residents with cancer of the uterus seen in Shelby County during 1950 and 1951, by year of diagnosis and site

Primary site	Total	Diagnosed—		
		1951	1950	Prior to 1950
Total.....	498	169	178	151
Invasive neoplasms.....	441	139	157	145
Cervix.....	354	103	125	126
Corpus.....	45	17	15	13
Other and unspecified.....	42	19	17	6
Carcinoma in situ of the cervix.....	57	30	21	6

the white and nonwhite populations (table 4). Although the number of cases of cervical cancer seen among white and nonwhite women in these 2 years was about the same, many more cases of cancer of the uterine corpus occurred among white than among nonwhite women. Again the carcinomas in situ of the cervix diagnosed in these 2 years is shown, but cannot be used for computing rates for the reason previously stated.

The ratio of cancer of the cervix to that of the uterine corpus in other southern metropolitan areas has been found to be in the order of 4 or

5 to 1. In Shelby County, among white women the ratio was 4.5 to 1; but among nonwhite women it was 16.4 to 1. This ratio is unusually high. However, only 7 cases of cancer of the uterine corpus were reported among nonwhite women, whereas there were 20 cases of uterine cancer unspecified as to whether the cervix or corpus was primarily involved. The ratio might be affected considerably if a fair proportion of these latter belong with the corpus group. The cases of uterine cancer that were unspecified as to whether they were primarily in the cervix or corpus constituted 14 percent of

Table 3. Shelby County residents¹ with uterine cancer diagnosed in 1950 and 1951: percent microscopically confirmed by source of report, race, and site

Primary site and race	All cases		Reported by hospitals		Reported by physicians only	
	Number of reported cases	Percent microscopically confirmed	Number of reported cases	Percent microscopically confirmed	Number of reported cases	Percent microscopically confirmed
All persons						
Total.....	313	93.6	290	96.2	23	60.9
Invasive neoplasms.....	263	92.4	240	95.4	23	60.9
Cervix.....	214	93.4	197	95.4	17	70.6
Corpus.....	30	96.7	28	100.0	2	50.0
Other and unspecified.....	19	73.7	15	86.7	4	25.0
Carcinoma in situ of the cervix.....	50	100.0	50	100.0	0	-----
White						
Total.....	162	94.4	153	95.4	9	77.8
Invasive neoplasms.....	140	93.6	131	94.6	9	77.8
Cervix.....	107	93.4	101	94.0	6	83.3
Corpus.....	23	95.6	21	100.0	2	50.0
Other and unspecified.....	10	90.0	9	88.9	1	100.0
Carcinoma in situ of the cervix.....	22	100.0	22	100.0	0	-----
Nonwhite						
Total.....	151	92.7	137	97.1	14	50.0
Invasive neoplasms.....	123	91.0	109	96.3	14	50.0
Cervix.....	107	93.4	96	96.9	11	63.6
Corpus.....	7	100.0	7	100.0	0	-----
Other and unspecified.....	9	55.6	6	83.3	3	0
Carcinoma in situ of the cervix.....	28	100.0	28	100.0	0	-----

¹ Excludes cases obtained from death certificates only (1950, 19 cases; 1951, 15 cases).

Table 4. Number of residents with cancer of the uterus diagnosed in Shelby County during 1950 and 1951, by race and site

Primary site	Total	White	Non-white
Total.....	347	176	171
Invasive neoplasms.....	296	154	142
Cervix.....	228	113	115
Corpus.....	32	25	7
Other and unspecified.....	36	16	20
Carcinoma in situ of the cervix.....	51	22	29

all the invasive uterine malignancies among nonwhite women, and 10 percent among the white.

The actual numbers of cases occurring among white and nonwhite women given in table 4 do not reflect the relative frequency of occurrence of uterine cancer among these two population groups of women. To determine relative frequency it is necessary to relate the cases to the base population from which these arose in the form of rates per unit of population. Age-specific rates provide a means of making even more refined comparisons as to the relative frequency of occurrence of the disease at different ages. The population figures used in computing the rates given in this report were from the United States Census of Population, 1950. The terms "incidence" and "prevalence" have been defined as:

Incidence. Average annual number of cases first diagnosed during the study period, per 100,000 female population, including cases obtained from death certificates.

Prevalence. Average number of cases known to have had cancer at any time during each study year, per 100,000 female population. This is to be distinguished from the prevalence rate defined in a previous paper (1) where the rate refers to the prevalence of undiagnosed cancer, rather than prevalence of diagnosed cancer as used here.

For women of all ages, the age-adjusted nonwhite incidence rate for cancer of the cervix is 1.7 times that for white women, whereas the reverse is true for cancer of the uterine corpus for which white women have over twice as high

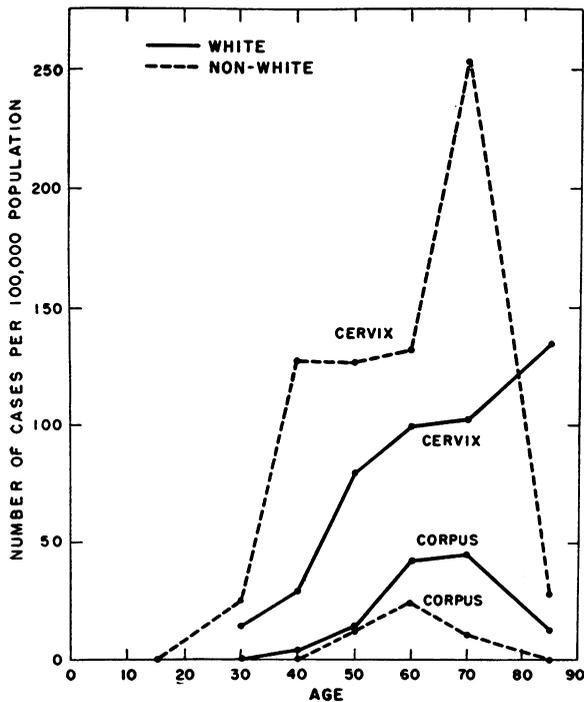
a rate as do nonwhite women (table 5 and figure). The age-specific incidence rates for cervical cancer among nonwhite women exceed those for white women for all age groups except those 75 years and over. It is likely that the low rate for nonwhite women in this age period is not correct, but is the result of inaccuracies in the age given by elderly nonwhite women with cervical cancer and of under-reporting. This explanation is also suggested by the fact that there were no cases of cancer of the uterine corpus or uterus unspecified in this age group,

Table 5. Residents with uterine cancer, Shelby County, 1950 and 1951, average annual incidence rate per 100,000 population, by race, age, and site

Age and race	Total	Cervix	Corpus	Other and unspecified
All cases				
Total ¹	62.7	47.7	7.3	7.7
Under 25.....	.5	.5	0	0
25-34.....	20.3	19.2	0	0
35-44.....	86.5	82.5	2.7	1.3
45-54.....	124.9	98.1	14.3	12.5
55-64.....	176.4	112.0	36.4	28.0
65-74.....	237.3	159.6	32.7	45.0
75 and over.....	148.4	102.0	9.3	37.1
White				
Total ¹	52.2	37.6	8.9	5.7
Under 25.....	0	0	0	0
25-34.....	15.3	15.3	0	0
35-44.....	58.4	54.1	4.3	0
45-54.....	103.1	79.6	14.7	8.8
55-64.....	160.8	101.6	42.3	16.9
65-74.....	181.8	103.9	45.4	32.5
75 and over.....	205.1	136.7	13.7	54.7
Nonwhite				
Total ¹	79.7	64.1	4.4	11.2
Under 25.....	1.2	1.2	0	0
25-34.....	30.3	26.9	0	3.4
35-44.....	131.0	127.6	0	3.4
45-54.....	158.2	126.5	13.6	18.1
55-64.....	206.7	132.3	24.8	49.6
65-74.....	332.1	254.6	11.1	66.4
75 and over.....	28.8	28.8	0	0

¹ Adjusted for age on the total population of the continental United States, 1950.

Age-specific incidence rates for cancer of the uterine corpus and of the cervix, by race, 1950 and 1951, Shelby County, Tenn.



and by the apparently excessive cervical cancer incidence rate for the 65-74 age group.

The comparison between white and nonwhite women for cancer of the uterine corpus is just the reverse of that for the cervix: The rates for white females exceed those for nonwhite females in all age groups. However, a higher proportion of uterine cancers were unspecified as to cervix or corpus among nonwhite patients, and if these could be properly assigned, the difference in these rates might be somewhat less.

The average annual incidence and prevalence rates of uterine cancer are compared in table 6. For both white and nonwhite women the prevalence is about 1.6 times the incidence of cervical cancer for all ages, and for cancer of the corpus it is 1.4 for white women and 1.9 for nonwhite women. From this it can be said there are a little more than half again as many old uterine cancer cases seen each year as there are newly diagnosed patients.

Discussion

Incidence rates for cancer of the uterine cervix and corpus separately have been difficult to

obtain for the general population because frequently the reporting source does not specify which portion of the uterus was the primary site of cancer. Even in this study where cancer of the uterus was the sole interest, the primary site in the uterus could not be determined for 10 percent of white patients and 14 percent of nonwhite patients. However, since about 10 percent of reported cases were obtained from death records where designation as to cervix or corpus is infrequent, the percentage unspecified is about as low as can be reasonably expected.

Since the incidence rates for cancer of the uterine corpus are considerably less than those

Table 6. Ratio of uterine cancer prevalence to incidence, by site and race, Shelby County, 1950 and 1951

Race and ratio	Total	Cervix	Corpus	Other and unspecified
All persons				
Prevalence rate-----	96.9	76.5	11.2	9.2
Incidence rate-----	62.7	47.7	7.3	7.7
Ratio ¹ -----	1.55	1.60	1.53	1.19
White				
Prevalence rate-----	81.8	61.9	12.5	7.4
Incidence rate-----	52.2	37.6	8.9	5.7
Ratio ¹ -----	1.57	1.65	1.40	1.30
Nonwhite				
Prevalence rate-----	120.2	99.2	8.5	12.5
Incidence rate-----	79.7	64.1	4.4	11.2
Ratio ¹ -----	1.51	1.55	1.93	1.12

¹ Prevalence to incidence.

NOTE: Rates are expressed as number of cases per 100,000 female population and are adjusted for age on the total population of the continental United States, 1950.

for the cervix among both white and nonwhite women, they would be affected proportionately more by the assignment of unspecified cases, if this were possible. The age-specific incidence rates for cancer of the cervix, then, are closer approximations to the true rates than are those for the uterine corpus.

Previous morbidity studies have demon-

strated that cancer of the uterus is more frequent among nonwhite women than among white. This observation is confirmed by the Memphis-Shelby County data. It also appears, however, that the increased frequency of uterine cancer among nonwhites is not consistent for both the uterine cervix and corpus. While cancer of the cervix, where the bulk of uterine cancers occur, is more frequent in nonwhite women than in white, the uterine corpus is involved less frequently.

As stated earlier, the primary purpose of this morbidity study is to obtain age-specific incidence rates for cancer of the uterine cervix. These rates provide the base of reference for the analysis of data being accumulated from the vaginal cytology survey now being conducted in Memphis and Shelby County. The incidence rates determined here provide a measure of the amount of cervical cancer this female population is producing annually. However, present evidence indicates that cervical cancer, when symptomatic or clinically evident, as it usually is when diagnosed, has already been present many months or years. Therefore, a female population contains many individuals at all times with cervical cancer in various stages of development in addition to those that have progressed to the stage where medical advice is sought and the diagnosis made.

Vaginal exfoliative cytology provides a means of screening a female population to identify those that will be found on detailed study to have presymptomatic and preclinical malignant lesions. Relating these cases to the population of women examined will provide prevalence rates for carcinoma in situ and presymptomatic invasive cancer of the cervix which can be compared to the rates reported here for drawing conclusions as to the probable average duration of the various stages of cervical cancer.

Repeated annual cytologic rescreening of the same population will again provide incidence rates for cervical carcinoma but at a much earlier stage of the disease. If carcinoma in situ of the cervix is the usual precursor of invasive carcinoma of the cervix, then this will be the new stage of recognition of the disease in the population being searched periodically for cervical cancer by exfoliative cytology screening.

Summary

1. The results of a morbidity study of uterine cancer in Memphis and Shelby County, Tenn., are reported.
2. Cervical cancer is a more frequent disease among nonwhite females than white in this community, but the reverse is true of cancer of the uterine corpus.
3. The use of these data as a point of reference for analyzing the data being accumulated in the vaginal cytology screening project now being carried on among the women of this community is briefly discussed.

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